In this semester project, you are asked to design, develop, and test an information system for the Northwind database as a front-end web site to allow for:

- Customers that have capabilities that include: register, create, and manage an account; set and management various payment types; the ability to look up information by product name, supplier name, categories, and the category enhancements from Phase I; and, to place an order for one or more products that may be shipped to multiple locations.

- Employees that have capabilities that include: entering products (data from Products entity) and adding new categories including the enhancement of categories; purchasing new and in inventory products from suppliers; review information on each customer including a customer’s demographics and their orders; and, interact with customers to approve each “order” of customer which involves generating the invoice.

- Administrative employees that have capabilities that include all of the Employee capabilities plus: the ability to run a wide range of reports on overall sales by month, by durational period (start and end date), by city and/or state and/or country; reports on sales of customers by month, by durational period (start and end date), by city and/or state and/or country; reports on employee productivity by employee and broken down on a customer by customer basis which includes data such as the number of customer(s) per employee and sales of those customer(s) by employee also by month or durational period (start and end date); and, inventory reports on products by categories and names and suppliers.

The remainder of this Phase II assignment specifies and explanation additional requirements.

Conceptual design is a combination of requirements analysis, software engineering, and database design, which can be utilized to arrive at a functional and data driven characterization for a Northwind web app, a search, ordering, and inventory website that is being set up with the objective of providing the best services to its customers by keeping their services at the leading edge of technology. This is clearly a norm for many of the various e-business web sites. You have been hired to set-up an information system and associated user interfaces to assist Northwind web app in achieving its goals. A preliminary requirements analysis has been conducted below that has identified a number of characteristics and features the operations (business processes) and goals of Northwind web app. You, as the systems analyst/designer/engineer, are strongly encouraged to add, expand, and refine these requirements in order to achieve a richer design.

For this project, you will develop an information management system that supports some of the services involved in searching, ordering, and inventory for a media app backended by the Northwind database. In the following pages, the functionality of Northwind web app is discussed with examples given using another application to demonstrate the different types of screens. using figures and a discussion of the flow that exists to take a user from screen to screen. Remember, the requirements in this document are a baseline and can be enhanced with additional capabilities as part of your requirements analyses and your solution choices.

Note that in explaining the different user interfaces for customers, employees, and administrators of Northwind, we utilize sample screens from one of the solutions of the Chinook project (http://www.engr.uconn.edu/~steve/Cse4701/cse4701spr15proj.pdf) that are illustrative of major types of user interface screens including: login/registration/edit info screens; the main profile screen for users (akin to Customers in Northwind schema); a screen for data entry to create new Tracks/Albums (akin to create a new Product/Category in Northwind schema); a screen for
searching for Tracks and Albums (akin to searching by product name, category, in-stock amount, etc.); and a report generation screen (akin to reports for administration as described above).

LOGIN/REGISTRATION/EDIT SCREENS

The Northwind web app needs to have login, registration, and edit screens for customers as shown in Figures 1a and 1b from the Chinook project from Fall 2015. Note that you should conform to the required fields to the Customer entity of the Northwind Schema. There are separate screens needed to:

1. Register for an account on the web app.
2. Login to a registered account (but no need for password recovery)
3. Edit/Modify your profile.

In support of registration, you need to allow entry of: First and Last Names, Company Name (optional), Address/City/State/Country/Postal Code, Phone, Fax, and Email. All of the other data entry fields are required.

CUSTOMER SCREENS

When a Customer or Employee logs on to the Northwind Web app, there should be a main screen that displays a dashboard of the main actions for each. Figure 2a and 2b displays this dashboard for job seekers in the Chinook. The general activities include:

- Customer Dashboard Screen:
  - Buttons to log off, edit profile (goes to another screen), and set/edit payment types (goes to another screen).
List of active and completed orders where clicking an order goes to another screen to show the status and content of each order.
- Quick Search in order to look up by media type and artist name.
- Link to Order Screen that lets a customer place an Order on Products by product name, supplier name, categories, and the category enhancements from Phase I, etc. The Order screen is tied to a Shopping Cart.
- A Shipping Screen (not shown) that allows a Customer to choose OrderID/ProductID combinations to a particular address, with multiple addresses supported per one order.

There are a set of screens for the customer available for the Customer Dashboard includes:

- Edit Profile Screen – see Figures 1a and 1b again
- Search Screen: A search screen (see Figures 3a and 3b) that allows Customers to search Products by product name, supplier name, categories, and the category enhancements from
Phase I, etc. This is to help the user review the available inventory of products for which to purchase from.

- **Order Screen**: A screen for that lets a customer create an order on Products by product name, supplier name, categories, and the category enhancements from Phase I, etc. This can reuse the code or link to the Search Screen. The Order screen is tied to a Shopping Cart.
- **Set/edit payment types Screen** in Figure 4 that lets a customer choose credit card, check, paypal, Google Pay, and Apple Pay options.
- **Shopping Cart Screen** in Figure 5 to show the items that are being placed for potential order. Time permitting, you should add the ability to edit the order (remove tracks) but this is not an immediate initial features.
- **Pending/Completed Orders and Status Screen** which is not shown should drill down to one order in a read only mode to view a specific order when reached from the selection on the Customer Dashboard.
EMPLOYEE SCREENS

- Employee Dashboard Screen in Figure 6a:
  - Button to log off.
  - List of Active Customer Order (to be filled) where clicking an order goes to another screen to show the status and content of each order. This will involve processing the order and interacting with customers on screen that is enabled from the click.
  - Links to separate screens for: Enter/Edit New Products/Categories and Review Customer Demographic Screen.
  - Search Screen: A search screen that allows Employees to search Products by product name, supplier name, categories, and the category enhancements from Phase I, etc. in order to manage inventory. Similar to Figures 3a and 3b.
  - Inventory/Purchasing Screen is dual purpose to: monitor the inventory (via Search) and to order new and existing inventory items (products) from Suppliers.
There are a set of screens for employee including:

- **Active Order Screen** - where clicking an order from the dashboard goes to another screen to show the status and content of each order. This should have a similar content and structure to the “Pending/Completed Orders and Status Screen” of the Customer. This will also involve additional capabilities for processing the order and interacting with customers on screen that is enabled from the click.

- **Enter/Edit New Product Screen** – this allows for an Employee to get new and current products from suppliers – see Figure 7.

- **Review Customer Demographic Screen** – this screen should be similar to the edit profile screen (see Figure 6b) but it should include the ability to search for a customer by different means. This could include any of: First and Last Names, Company Name, Address/City/State/Country/Postal Code, Phone, Fax, and Email; whatever seems appropriate.

![Figure 6b. Advanced Employee Dashboards.](image)
ADMINISTRATIVE SEARCH SCREENS:

The Administrator Dashboard Screen in Figure 8a contain all of the capabilities of the Employee Dashboard Screen previously described with additional capabilities and screens that include:

- Ability to access the Employee: Active Order Screen, Enter/Edit Product Screen, and Review Customer Demographic Screen.
- Adding new Employee screen in Figure 8b.
Four Main Reporting Screens for:

- Sales Reporting: A screen that has the ability to run a wide range of reports on overall sales by month, by durational period (start and end date), by city and/or state and/or country; reports on sales of customers by month, by durational period (start and end date), by city and/or state and/or country
- Employee Productivity Reporting: A screen that has the ability to run a wide range of reports on employee productivity by employee and broken down on a customer by customer basis which includes data such as the number of customer(s) per employee and sales of those customer(s) by employee also by month or durational period (start and end date)
- Inventory Reporting: A screen that has the ability to run a wide range of reports on products by name, category, supplier, amounts (in stock, reorder limit, etc.). These can be summary reports product name, product category, supplier name, amounts, etc.
- Customer Reporting: A screen that has the ability to run a wide range of reports on the interests of customers in terms of music and media preferences. This can include looking at what a specific customer prefers in terms of products, categories, etc., or might be statistical analysis across multiple customers to determine preferences by state and/or country. Each Group is tasked with defining the scope of customer reporting for their project.

To illustrate, Figures 9a, 9b, and 9c contains different reporting screens. There are two possible approaches. First, parameterizable queries are defined and implemented. Second, a set of selection criteria that are then chosen by the user and a query is formulated and submitted. For the three main screens, specific requirements could include the following. Note that a number of different searching dimensions are identified.

- Sales Reporting: There a number of dimensions that can be used singularly or combined. The duration dimension would support search by day, month, year, or date range. The location dimension of would support by city/state/country. The product dimension would allow different combinations of: product name, category, amounts, suppliers, etc. The customer dimension would include: single customer, set of customers (selected by
administrator), customers in a city, customers in a state, customers in a country. Any one or more could be combined. The sales reporting would be taken from the Order and OrderDetails Tables for the appropriate costs (sales can be total or broken down – another dimension) which could include both the individual prices as well as the total Sales and the Quantity.

- Employee Productivity Reporting: Run reports on a given employee that has selections by: number of customer(s) per employee and sales of those customer(s) by employee also by month or durational period (start and end date). The report needs to work for all combinations. These reports focus on the sales/productivity for a particular employee. This would include the duration, location, product, and customer dimensions from the Sales Reporting.

- Inventory Reporting: Drop down selections for: A screen that has the ability to run a wide range of reports on the product dimension would allow different combinations of: product name, category, amounts, suppliers, etc. The report needs to work for all combinations.

- Customer Reporting: A screen that has the ability to run a wide range of reports on customer buying preferences. The customer dimension would include: single customer, set of customers (selected by administrator), customers in a city, customers in a state, customers in a country. The product dimension would allow different combinations of: product name, category, amounts, suppliers, etc. As defined, the customer dimension also includes location dimension characteristics. The duration dimension would support search by day, month, year, or date range to look at buying trends during holidays, during slow months, etc.
FINAL REPORT REQUIREMENTS

The final report, due at end of the third phase, should be an integrated report. For the list of relational instances you use to populate your database, you should take data from a realistic situation, and make sure that your data shows some variety. The report for Phase II must include the following six components:

1. A description of the purpose of this phase of the project and the list of tasks, a summary of the system requirements and any additions or any revisions made to the specification and the design in the previous two phases,
2. The description of the list of problems encountered and your solutions.
3. The system architecture, and the design and description of all functions, including the list of required ones and the list of functions that your group add into the Chinook.com system.
4. A User Manual that illustrates the way that each main component of your solution works. Include screen shots as figures to illustrate the various activities by seekers, posters, and administrators.
5. The conclusion that evaluates the system you have implemented, the current limitations and the potential for improvements.
6. Each team member will provide an updated description on your contributions to the group project and what you learned from this project and the team work. This is the individual contributions on the web page. In addition, each of you must confidentially submit the final self-assessment by email to steve@engr.uconn.edu without consulting any of your team members. This information is advisory only!
7. The collection of all of the submittals for the project, including: Phase I report and Phase II report which includes (1) the GROUPZNorthwind.sql File, (2) the source code of the application, and (3) the relational instances you use to populate the database, (4) a sample output of the Chinook.com query and update programs, including the summarization outputs, and an attachment of a user manual for the system.

A hard copy of all the above components is expected – due date to be announced. Together with the hard copy of your final project report, you need to turn in the report and the source code in electronic form using a winziped file. A more precise rundown of the final requirement will be given two weeks before the project is due.

Remember, it is critical that you put together a professional, well-organized document of your project. Sample final (Phase II) reports will be distributed in the coming weeks.